4.11 Noise

This section describes the potential environmental effects related to temporary and permanent increases in noise from construction and operation of the proposed CIP projects within the Master Plans. Refer to Section 4.2 (Biological Resources) of this EIR for a discussion of potential noise impacts to sensitive species.

As discussed in Chapter 4, Environmental Analysis, the following CIP projects have been adequately addressed in previous CEQA documents and are not included in this analysis: Sewer CIP Projects SR-6, SR-10, SR-25, N-1, N-2, N-5, N-7, N-8, N-10, N-11, I-3, I-4, I-5, and I-6; Water CIP Projects 7, 8, 40, and R6; and Recycled Water CIP Projects ES3.

4.11.1 Environmental Setting

4.11.1.1 Fundamentals of Environmental Noise

Noise is commonly defined as unwanted sound. Sound pressure magnitude is measured and quantified using a logarithmic ratio of pressures, the scale of which gives the level of sound in decibels (dB). Sound pressures in the environment have a wide range of values. The sound pressure level is the logarithm of the ratio of the unknown sound pressure to a reference quantity of the same kind. To account for the pitch of sounds and the corresponding sensitivity of human hearing to them, the raw sound pressure level is adjusted with an A-weighting scheme based on frequency that is stated in units of decibels (dBA). Typical A-weighted noise levels are listed in Table 4.11-1.

A given level of noise may be more or less tolerable depending on the sound level, duration of exposure, character of the noise sources, the time of day during which the noise is experienced, and the activity affected by the noise. For example, noise that occurs at night tends to be more disturbing than that which occurs during the day because sleep may be disturbed. Additionally, rest at night is a critical requirement in the recovery from exposure to high noise levels during the day. In consideration of these factors, different measures of noise exposure have been developed to quantify the extent of the effects anticipated from these activities. Some indices consider the 24-hour noise environment of a location by using a weighted average to estimate its habitability on a long term basis. Other measures consider portions of the day and evaluate the nearby activities affected by it as well as the noise sources. The most commonly used indices for measuring community noise levels are the Equivalent Energy Level (Leq), and the Community Noise Equivalent Level (CNEL).

- **Leq**, the Equivalent Energy Level, is the average acoustical or sound energy content of noise, measured during a prescribed period, such as 1 minute, 15 minutes, 1 hour, or 8 hours. It is the decibel sound level that contains an equal amount of energy as a fluctuating sound level over a given period of time.
- **CNEL**, Community Noise Equivalent Level, is the average equivalent A-weighted sound level over a 24-hour period. This measurement applies weights to noise levels during evening and nighttime hours to compensate for the increased disturbance response of people at those times. CNEL is the equivalent sound level for a 24-hour period with a +5 dBA weighting applied to all sound occurring between 7:00 p.m. and 10:00 p.m. and a +10 dBA weighting applied to all sound occurring between 10:00 p.m. and 7:00 a.m.

Table 4.11-1 Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans 1998.

The decibel level of a sound decreases (or attenuates) exponentially as the distance from the source of that sound increases. For a single point source such as a piece of mechanical equipment, the sound level normally decreases by about 6 dBA every time the distance between the source and listener is doubled (doubling of distance). Sound that originates from a linear, or "line" source such as a heavily traveled traffic corridor, attenuates by approximately 3 dBA per doubling of distance, provided that the surrounding site conditions lack ground effects or obstacles that either scatter or reflect noise. Noise from roadways in environments with major ground effects due to vegetation and loose soils may either absorb or scatter the sound yielding attenuation rates as high as 4.5 dBA for each doubling of distance. Other contributing factors that affect sound reception include meteorological conditions and the presence of manmade obstacles such as buildings and sound barriers.

Noise has a significant effect on the quality of life. An individual's reaction to a particular noise depends on many factors such as the source of the noise, its loudness relative to the background noise level, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is perceivable, while 1 to 2 dBA changes generally are not perceived. Although the reaction to noise may vary, it is clear that noise is a significant component of the environment, and excessively noisy conditions can affect an individual's health and well-being. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on a community can be organized into six broad categories: sleep disturbance, permanent hearing loss, human performance and behavior, social interaction of communication, extra-auditory health effects, and general annoyance.

Community noise environments are typically represented by noise levels measured for brief periods throughout the day and night, or during a 24-hour period (i.e., by DNL/L_{dn} or CNEL). The one-hour period is especially useful for characterizing noise caused by short-term events, such as operation of construction equipment or concert noise (i.e., with L_{eq}). Community noise levels are generally perceived as quiet when the CNEL is below 50 dBA, moderate in the 50 to 60 dBA range, and loud above 60 dBA. Along major thoroughfares, roadside noise levels are typically between 65 and 75 dBA.

4.11.1.2 Fundamentals of Environmental Vibration

Vibration consists of waves transmitted through solid material. Ground-borne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be comprised of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in Hertz (Hz). The normal frequency range of most ground-borne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz.

Vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. Ambient and source vibration are often expressed in terms of the peak particle velocity (PPV) or root mean square (RMS) velocity in inches per second (in/sec) that correlates best with human perception. The Federal Transit Authority estimates that the threshold of perception is approximately 0.0001 in/sec RMS and the level at which continuous vibrations begins to annoy people is approximately 0.001 in/sec RMS (FTA 2006).

Ground-borne vibration can be a concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving and operating heavy earth-moving equipment.

4.11.1.3 Existing Noise Conditions

The sewer, water, and recycled water service areas include a wide range of land uses. The following discussion describes the primary transportation noise sources and operational noise sources that contribute to the existing noise environment.

Transportation Noise Sources

Roadways

Traffic on roadways is the most substantial and common source of noise within the service areas. The number and type of roads vary within the service areas. Interstate 5 (along the western border) is a major freeway in San Diego County. Carlsbad contains three major arterial roads including El Camino Real which runs north/south through the center of the city, Palomar Airport Road which runs east/west through the center of the city, and Rancho Santa Fe Road which runs along the southern and easterly boundary of the city. Palomar Airport Road turns into San Marcos Boulevard, a major arterial in the area of San Marcos within the CMWD service area. Melrose Drive and Sycamore Avenue are major arterials in the areas of Vista and Oceanside in the project area.

Aviation

McClellan-Palomar Airport is located within Carlsbad. It is owned by the County of San Diego and serves the general aviation community, corporate aircraft and commercial services in the northern part of the county. Oceanside Municipal Airport, a public airport, is located approximately 500 feet north of Water CIP Project 52 within the city of Oceanside. The Oceanside Municipal Airport features one runway and covers 43 acres. It is used primarily for general aviation.

Railroad

The AT&SF Railroad runs parallel to the coastline from north to south through Carlsbad. This track is used by the AT&SF freight line, the Amtrak commuter rail line, and the North County Transit District Coaster commuter rail line.

Operational Noise Sources

Noise associated with commercial and industrial operations throughout the service areas can include on-site machinery operation, outdoor truck activity, air compressors, and/or generators. The degree of noise generated by commercial or industrial uses is dependent upon various factors, including type of industrial activity, hours of operation, and the location relative to other land uses. Agricultural noise sources that generate the highest sound levels are chainsaws, crop dusting aircraft, and tractors. In addition, operation of exterior exhaust and cooling system equipment typically used in greenhouse operations can be a source of noise that may affect surrounding land uses. Existing City and CMWD facilities, such as pump and lift stations, contribute to the overall noise environment at varying levels throughout the service areas.

4.11.1.4 Noise-Sensitive Land Uses

Noise-sensitive land uses (NSLU) include uses where an excessive amount of noise would interfere with normal activities. Primary NSLU include residences, public and private educational facilities, hospitals, convalescent homes, hotels/motels, daycare facilities, and passive recreational parks. Sleep disturbance is the most critical concern for a NSLU on a 24-hour basis or longer compared to activities that are occupied only a portion of a day.

The sewer, water, and recycled water service areas encompasses most of the city of Carlsbad, and portions of the cities of San Marcos, Vista, and Oceanside. Existing land uses within the service areas include a wide variety of residential, commercial and office, industrial, public facilities and utilities, parks and recreation, agriculture and undeveloped areas. The primary NSLU in Carlsbad and the surrounding area is residential land use. Libraries, schools, churches and some passive parks and recreation areas also represent NSLU in the service areas.

4.11.1.5 Vibration-Sensitive Land Uses

Vibration-sensitive land uses include facilities where vibration would interfere with operations within the building, such as vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, and university research operations. The degree of sensitivity to vibration depends on the specific equipment that would be affected by the vibration. Electron microscopes and high-resolution lithography equipment function within certain scientific and manufacturing tolerances that can be compromised in high vibration environments. Certain fragile older or historic buildings may be

vulnerable to damage from excessive vibration. Residential uses are also sensitive to excessive levels of vibration of either a regular or an intermittent nature.

4.11.2 Regulatory Framework

4.11.2.1 Federal

Federal Transit Administration Standards

Although the Federal Transit Administration standards are intended for federally funded proposed mass transit projects, the impact assessment procedures and criteria included in the Administration Transit Noise and Vibration Impact Assessment (May 2006) are routinely used for projects proposed by local jurisdictions.

4.11.2.2 State

California Noise Control Act of 1973

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, finds that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the state has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the state to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

4.11.2.3 Local

The service areas include the jurisdictions of Carlsbad, San Marcos, Oceanside, and Vista.

City of Carlsbad Noise Ordinance

The Carlsbad Noise Ordinance is codified in Chapter 8.48 of the City Municipal Code and addresses noise from construction activity only. This chapter states that the erection, demolition, alteration, or repair of any building or structure or the grading or excavation of land in such a manner as to create disturbing, excessive or offensive noise during the following hours constitutes a noise violation:

- After sunset on any day, and before 7:00 a.m., Monday through Friday, and before 8:00 a.m. on Saturday.
- All day on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day and Christmas Day.

The City Manager may grant exceptions to these requirements by issuing a permit in the following circumstances:

- When emergency repairs are required to protect the health and safety of any member of the community.

- In nonresidential zones, provided there are no inhabited dwellings within one thousand feet of the building or structure being erected, demolished, altered or repaired or the exterior boundaries of the site being graded or excavated.

City of Carlsbad General Plan Noise Element

The Noise Element of the Carlsbad General Plan identifies a noise level of 60 dBA (CNEL) as the exterior noise level to which all residential units outside of the McClellan-Palomar Airport noise contours should be mitigated. There are no standards cited in the Noise Element relative to commercial or industrial land uses.

City of San Marcos Noise Ordinance

The San Marcos Noise Ordinance (Chapter 10.24 of the Municipal Code) governs operational noise and establishes the maximum one-hour average sound levels for various land uses (Table 4.11-2). San Marcos has adopted applicable standards from the San Diego County Noise Ordinance. The Noise Ordinance sets an allowable noise level for single-family residential areas to 50 dBA Leq from 7:00 a.m. to 10:00 p.m., and 45 dBA Leq from 10:00 p.m. to 7:00 a.m. Multi-family residential areas are limited to 55 dBA Leq from 7:00 a.m. to 10:00 p.m. and 50 dBA Leq from 10:00 p.m. to 7:00 a.m.

Table 4.11-2 City of San Marcos Exterior Noise Standards

Zone[(1)]	Applicable Limit (decibels)[(2)]	Time Period
R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-88, S-90, S-92, R-V, and R-U Use Regulations with a density of less than 11 dwelling units per acre.	50 45	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.
R-RO, R-C, R-M, C-30, S-86, R-V AND R-U Use Regulations with a density of 11 or more dwelling units per acre.	55 50	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.
S-94 and all other commercial zones.	60 55	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.
M-50, M-52, M-54	70	anytime
S-82, M-58, and all other industrial zones.	75	anytime

(1) Refer to the San Diego County Zoning Ordinance for a list of zones represented by the abbreviations in this table. Available at http://www.sdcounty.ca.gov/dplu/zoning/index.html

(2) One-hour average sound level.

Source: County of San Diego Code of Regulatory Ordinances, Section 36.404, 2009

Construction noise is governed by San Marcos Noise Ordinance Section 10.24.020 "Examples of Prohibited Noises." The following describes construction activity that would be considered a violation of the noise ordinance: "Erection or demolition of buildings, excluding owner/resident additions or remodels, and the grading and excavation of land including the use of blasting, the start up and use of heavy equipment such as dump trucks and graders and the use of jack hammers except on weekdays Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. and on Saturdays 8:00 a.m. to 5:00 p.m. In cases of urgent necessity or in the interest of public health and safety, the City Manager may waive any or all of the provisions of the subsection."

City of Oceanside Noise Ordinance

Chapter 38 of the Oceanside Municipal Code governs operational noise and contains the maximum one-hour average sound levels for various land uses for operational noise (Table 4.11-3). The Noise

Ordinance sets an allowed level for single-family and medium density residential areas to 50 dBA Leq from 7:00 a.m. to 9:59 p.m., and 45 dBA Leq from 10:00 p.m. to 6:59 a.m. High density residential areas are limited to 55 dBA Leq from 7:00 a.m. to 9:59 p.m. and 50 dBA Leq from 10:00 p.m. to 6:59 a.m.

Table 4.11-3 City of Oceanside Exterior Noise Standards

Zone	Applicable Limit (decibels) [1]	Time Period
Residential Estate, Single-Family Residential, Medium Density Residential, Agricultural, Open Space	50 45	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
High Density, Residential Tourist	55 50	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Commercial	65 60	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Industrial	70 65	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.
Downtown	65 55	7:00 a.m. to 9:59 p.m. 10:00 p.m. to 6:59 a.m.

[1] One-hour average sound level.
Source: City of Oceanside Municipal Code, Section 38.12

Construction work may be exempt from the noise level limits established in Table 4.11-3 by the City Manager upon a determination that the authorization furthers the public interest. However, Section 38.17 specifically prohibits the operation of any pneumatic or air hammer, pile driver, steam shovel, derrick, steam, or electric hoist, parking lot cleaning equipment or other appliance, the use of which is attended by loud or unusual noise, between the hours of 10:00 p.m. and 7:00 a.m.

City of Vista

The City of Vista has also adopted the San Diego County Noise Ordinance for the purpose of controlling excessive noise levels, including noise from construction activities, within Chapter 8.32 of the Municipal Code, Noise Control (Vista Municipal Code Section 8.32.040). Table 4.11-4 lists the applicable exterior property line noise limits.

Table 4.11-4 City of Vista Exterior Noise Limits

Zone	Applicable Limit (decibels) [1]	Time Period
Agricultural (A-1); Estates (E-1); Open Space (O); Open Space Residential (OSR); Residence (R-1B); Mobile Home Park (MHP)	50	7:00 a.m. – 10:00 p.m.
	45	10:00 p.m. – 7:00 a.m.
Multi-Residential (RM)	55	7:00 a.m. – 10:00 p.m.
	50	10:00 p.m. – 7:00 a.m.
Commercial (C-1 and C-2); Office Park (O-3); Commercial Transient (C-T); Office Professional (OP)	60	7:00 a.m. – 10:00 p.m.
	55	10:00 p.m. – 7:00 a.m.
Industrial (I-P); Manufacturing, Processing, and Warehousing (M-1); all areas of Specific Plan 20	70	Anytime

[1] One-hour average sound level limit at the property line.

The adopted San Diego County Noise Ordinance also stipulates controlling construction noise. San Diego County Code Sections 36.408 and 36.409, Construction Equipment, state that, except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

- Between 7:00 p.m. and 7:00 a.m.
- On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, December 25th and any day appointed by the President as a special national holiday or the Governor of the state as a special state holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10:00 a.m. and 5:00 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410.
- That exceeds an average sound level of 75 decibels for an eight-hour period, between 7:00 a.m. and 7:00 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

4.11.3 Project Impacts and Mitigation

4.11.3.1 Issue 1 – Substantial Permanent Increases in Ambient Noise Levels

Noise Issue 1 Summary

Would implementation of the Sewer, Water, and Recycled Water Master Plans result in a substantial permanent increase in ambient noise levels or expose persons to noise in excess of standards?

Impact: Noise from the CIP projects would be attenuated using enclosures or other measures as necessary to comply with applicable noise ordinances.	**Mitigation:** No mitigation is required.
Significance Before Mitigation: Less than significant.	**Significance After Mitigation:** Impacts would be less than significant without mitigation.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the Master Plans would have a significant adverse impact if it would result in exposure of persons to or generation of noise levels in excess of standards established in applicable plans or noise ordinances, or otherwise result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. For the purposes of this analysis, the exterior noise standards used include the noise ordinances established by Carlsbad, San Marcos, Oceanside, and Vista, as applicable. These noise standards are discussed above under Section 4.11.2.3.

Impact Analysis

The potential for implementation of the Master Plans to result in increases in ambient noise from transportation noise sources and operational noise sources is discussed below. Temporary noise impacts resulting from construction activities are discussed in Section 4.11.3.2 (Issue 2).

Transportation Noise Sources

Transportation noise sources for the CIP projects would be primarily associated with vehicular trips by employees. However, as addressed in Section 4.2 (Air Quality) operation of CIP projects proposed under the Master Plans would not generate a significant volume of new vehicle trips. Most of the CIP projects make improvements to existing facilities or are passive pipeline projects that would not increase the number of maintenance trips typically required. Additionally, maintenance trips would be to facilities throughout the service areas and would not be concentrated on a specific roadway. Due to the minimal number and geographic distribution of vehicular trips associated with the maintenance of the CIP projects, transportation noise increases would be negligible. Therefore, implementation of the Master Plans would not result in significant permanent increases in ambient noise associated with transportation noise sources.

Operational Noise Sources

Operational noise sources associated with the CIP projects under the Master Plans could potentially affect nearby NSLU.

Sewer CIP Projects

The sewer pipeline projects (CIP Projects SR-1, SR-12, SR-13, SR-14, SR-16, SR-17, SR-18, SR-20, SR-21, SR-24, C-1 through C-4, N-3, N-4, N-6, N-9, N-12, and I-1) would be constructed underground and are passive facilities. Once installed, pipelines would not require the use of pumps, motors, or other noise-generating machinery. Operation of these facilities would not result in permanent increases in the ambient noise environment. Sewer CIP Projects SR-2 and SR-15 would replace existing pumps with new pumps of the same capacity. Similarly, several CIP projects would only replace or rehabilitate existing sewer facilities or assess facility conditions (SR-3, SR-4, SR-5, SR-7, SR-8, SR-9, C-5, E-1, and E-2). New access roads constructed as a result of CIP Projects SR-19, SR-22, and SR-23 would for the most part be passive facilities. Occasional maintenance vehicle trips would not generate substantial traffic noise. Therefore, no change in ambient noise level would occur as a result of these CIP projects. Removal of existing lift stations (CIP Project SR-11, Vancouver lift station, and Simsbury lift station) would remove existing sources of noise and result in a beneficial change to ambient noise levels surrounding the lift station sites.

Sewer CIP Project I-2 would install an additional 300 horsepower (hp) pump and manifold piping modifications at the Buena Vista lift station in Carlsbad. The operation of the additional pump may result in a noticeable increase in operational noise at this pump station. However, as listed in Section 2.6.2 (Project Design Features), the City of Carlsbad has committed to ensuring that operating equipment will be designed to comply with all applicable local, state, and federal noise regulations. For pump stations, this would entail enclosing the equipment in a structure. The additional pump at the Buena Vista lift station would be located in the existing structures, and the new Agua Hedionda pump would be installed on the south side of a new bridge in a new concrete structure. Occasional maintenance and emergency repair activities on any CIP project would have the potential to generate

some additional noise. These activities are sporadic in nature and do not occur at the same location for long periods of time. Therefore, implementation of the Sewer Master Plan would not result in a significant impact related to substantial permanent increases in ambient noise levels.

Water CIP Projects

Similar to the sewer pipeline projects, water pipeline projects (CIP Projects 48, 49, F1-F3, F5-F12, F-15, 2, 10, 17, 19, 21, 22, 25, 43, 45, 47, 50, and 54-56) would be passive and would not result in permanent increases in the ambient noise environment. No operational noise impact would occur. Reservoir improvement projects (R1, R2, R3, R4, R7, and R8) would make improvements to existing reservoir facilities. CIP Project R5 would relocate an existing tank. These CIP Projects would not result in new CIP facilities, and reservoirs are passive facilities. No pumps, motors, or other noise-generating machinery would be required as a result of the improvement projects. CIP Project 39 would install a new pressure regulating station (PRS) in addition to a pipeline extension; however, the PRS would be located below ground. CIP Projects 34, 44, 38, and 41 would make improvements to existing facilities and would not result in any new equipment or other noise sources. These CIP projects would not result in permanent increases in the ambient noise environment and no operational noise impact would occur.

CIP Project PS2 proposes to abandon and remove the Ellery pump station, which consists of four vertical turbine pumps mounted in suction barrels. The pump station would be replaced by a portable pump station, which would include one portable pump. Replacement of the pump station with a smaller capacity portable pump station would reduce noise levels in the surrounding area. CIP Project PS3 would remove the existing Buena Vista pump station, which would remove an existing source of noise and result in a beneficial change to ambient noise levels surrounding the pump station site.

CIP Project F14 would construct a new emergency pump station at Obelisco Place/Obelisco Circle to provide fire flow. The pump station would include two pumps (1 operating and 1 standby) with a capacity of 2,000 gpm each with 40 hp motors. A 150 kW standby power generator would also be installed. CIP Project PS4 would increase capacity of the Maerkle pump station by adding an additional pump. CIP Project 51 would construct a 100 gpm vertical turbine pump as part of well water supply facilities. CIP Project 52 would result in construction of a new 2,000 gpm vertical turbine pump and a 3.0 mgd reverse osmosis treatment plant for total dissolved solids reduction. CIP Project 46 would move a PRS downstream near the CMWD boundary and install hydroelectric turbines. The operation of new pumps and other equipment as a result of these CIP projects would have the potential to result in a noticeable increase in ambient noise in the area surrounding the pump stations. As listed in Section 2.6.2 (Project Design Features), CMWD has committed to ensuring that operating equipment will be designed to comply with all applicable local, state, and federal noise regulations. For example, pump stations would enclose equipment in structures. The Obelisco Place/Obelisco Circle pump station (CIP Project F14) would be placed with a concrete building. The new pump at the Calavera pump station (CIP Project PS1) would be located in a new structure. Occasional maintenance and emergency repair activities on any CIP project would have the potential to generate some additional noise; however, these activities are sporadic in nature and do not occur at the same location for long periods of time. Therefore, implementation of the Water Master Plan would not result in a significant impact related to substantial permanent increases in ambient noise levels.

Recycled Water Projects

Similar to sewer pipeline projects, the recycled water pipeline and meter projects (CIP Projects ES1, ES2, ES4A, ES4B, ES4C, ES5A, ES6, ES7, ES8, ES9, ES10, ES11, ES12, ES13, ES15, ES16, ES17, ES18, P73, P74,

P75, and P78) and storage projects (CIP Projects P76, P77, and P79) would be passive and would not result in permanent increases in the ambient noise environment. No operational noise impact would occur. CIP Projects P80 and P81 would increase the capacity of the CWRF by installing additional filtration units and chlorine contact basins. The CWRF currently generates noise from operation of pumps. Noise generating equipment would continue to be located within enclosures to attenuate noise. Additionally, as listed in Section 2.6.2 (Project Design Features), the City and CMWD have committed to ensuring that operating equipment will be designed to comply with all applicable local, state, and federal noise regulations. Therefore, the increase in capacity at the CWRF would not permanently increase the ambient noise level surrounding the CWRF. Occasional maintenance and emergency repair activities on any CIP project would have the potential to generate some additional noise. These activities are sporadic in nature and do not occur at the same location for long periods of time. Implementation of the Recycled Water Master Plan would not result in a significant impact related to substantial permanent increases in ambient noise levels.

Mitigation Measures

Impacts related to substantial permanent increases in ambient noise levels would be less than significant. No mitigation is required.

Significance After Mitigation

Impacts related to substantial permanent increases in ambient noise levels would be less than significant without mitigation.

4.11.3.2 Issue 2 – Temporary Increases in Ambient Noise

Noise Issue 2 Summary

Would implementation of the Sewer, Water, and Recycled Water Master Plans result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity?

Impact: Construction of CIP projects would not substantially increase ambient noise levels in the project vicinity.	**Mitigation:** No mitigation is required.
Significance Before Mitigation: Less than significant.	**Significance After Mitigation:** Impacts would be less than significant without mitigation.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the Master Plans would have a significant adverse impact if it would result in exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or otherwise result a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact Analysis

Construction of the CIP projects proposed under the Master Plans would result in temporary increases in ambient noise levels. Construction activities associated with CIP projects would involve the use of heavy equipment during land clearing, trenching and extraction, demolition of structures, construction of access roads and structures, and installation of some equipment, such as pumps. Equipment that would be associated with construction of the proposed CIP projects includes dozers, rollers, dewatering pumps, backhoes, loaders, cranes, and delivery trucks. The magnitude of the impact would depend on the type of construction activity, type of construction equipment, duration of the construction phase, distance between the noise source and receiver, and any intervening topography. Sound levels of typical construction equipment range from 60 dBA to 90 dBA at 50 feet from the source (FHWA 2006).

As listed in Section 2.6.2 (Project Design Features), the City and CMWD have committed to the following measures during construction of CIP projects to minimize noise effects to surrounding neighborhoods:

- Heavy equipment will be repaired at sites as far as practical from nearby residences.
- Construction equipment, including vehicles, generators and compressors, will be maintained in proper operating condition and will be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, acoustical lagging, and/or engine enclosures).
- Construction work, including on-site equipment maintenance and repair, will be limited to the hours specified in the noise ordinance of the affected jurisdiction.
- Electrical power will be supplied from commercial power supply, wherever feasible, in order to avoid or minimize the use of engine-driven generators.
- Staging areas for construction equipment will be located as far as practicable from residences.
- If lighted traffic control devices are to be located within 500 feet of residences, the devices will be powered by batteries, solar power, or similar sources, and not by an internal combustion engine.
- The City/CMWD or their construction contractors will provide advance notice, between two and four weeks prior to construction, by mail to all residents or property owners within 300 feet of the alignment. For projects that would require pile driving of blasting, noticing will be provided to all residents or property owners within 600 feet of the alignment. The announcement will state specifically where and when construction will occur in the area. If construction delays of more than 7 days occur, an additional notice will be made, either in person or by mail.
- The City/CMWD will identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise and other construction disturbance. The CMWD will also establish a program for receiving questions or complaints during construction and develop procedures for responding to callers. Procedures for reaching the public liaison officer via telephone or in person will be included in notices distributed to the public in accordance with the information above.
- For any construction activities which include blasting, a qualified blasting consultant and geotechnical consultant will prepare all required blasting plans and monitor all blasting activities in conformance with the Standards of the State of California, Department of Mines.

The City of Carlsbad prohibits construction after sunset on any day, and before 7:00 a.m., Monday through Friday, and before 8:00 a.m. on Saturday. Construction is prohibited all day on Sunday or holidays. In San Marcos, construction noise is limited to Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. and on Saturdays 8:00 a.m. to 5:00 p.m. In Oceanside, operation of any pneumatic or air hammer, pile driver, steam shovel, derrick, steam, or electric hoist, or other appliance, the use of which is attended by loud or unusual noise, is prohibited between the hours of 10:00 p.m. and 7:00 a.m. In Vista, construction is prohibited between 7:00 p.m. and 7:00 a.m. on any day, and all day Sunday or on a holiday. As discussed above, the City and CMWD would comply with all limits on construction hours established in the cities' noise ordinances.

The City of Oceanside and the City of Vista include additional requirements for construction noise. In Oceanside, construction is required to comply with the exterior noise standards in Table 4.11-3 unless the City Manager determines that construction furthers the public interest and exempts construction from this required. In Vista, construction may not exceed an average sound level of 75 dBA for an eight-hour period, between 7:00 a.m. and 7:00 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Water CIP Projects 48 and 52, and Recycled Water CIP Projects ES4B and ES4C are located or partially located in Oceanside. Water CIP Project 48 would rehabilitate an existing pipeline. Water CIP Project 52 would increase the availability of groundwater and the Recycled Water CIP Projects ES4B and ES4C increases the availability of recycled water. The Oceanside City Management would determine if these projects would further public interest and would be exempted from the hourly noise level limits. Regardless, the project design features above would minimize construction noise. Similarly, Water CIP Projects 48 and 49, and Recycled Water CIP Projects P78, P79, ES4A, ES4B, and ES4C are located in Vista. Construction noise would have the potential to exceed an 8-hour average sound level of 75 dBA. However, the project design features above would minimize construction noise. Additionally, the proposed CIP projects would not be constructed all at once and not all equipment would be operating at the same time. Pipeline projects would be constructed in a linear fashion and would only result in construction noise at a particular receptor for a short time. Implementation of the Master Plans would not result in substantial temporary or periodic increase in ambient noise levels.

Mitigation Measures

Impacts related to a substantial temporary or periodic increase in ambient noise would be less than significant. No mitigation is required.

Significance After Mitigation

Impacts related to a substantial temporary or periodic increase in ambient noise would be less than significant without mitigation.

4.11.3.3 Issue 3 – Excessive Groundborne Vibration or Noise

Noise Issue 3 Summary

Would implementation of the Sewer, Water, and Recycled Water Master Plans result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Impact: Construction of CIP projects would not result in excessive groundborne vibration and noise.	**Mitigation:** No mitigation is required.
Significance Before Mitigation: Less than significant.	**Significance After Mitigation:** Impacts would be less than significant without mitigation.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the Master Plans would have a significant adverse impact if it would result in the exposure of persons to or generation of excessive groundborne vibration equal to or in excess of 0.2 in/sec PPV. Construction activities within 200 feet and pile driving within 600 feet would be potentially disruptive to vibration-sensitive operations (Caltrans 2002).

Impact Analysis

Vibration sources associated with implementation of the Master Plans would be generated primarily from project construction. Once installed, the CIP project facilities include passive uses (pipelines, reservoirs) and pump stations, lift stations, PRS, and treatment facilities that do not generate substantial levels of vibration.

Construction-related vibration would have the potential to impact nearby structures and vibration-sensitive equipment and operations. The level of vibration generated from other construction activities would depend on the type of soils and the energy-generating capability of the construction equipment. According to Caltrans, the highest measured vibration level during highway construction was 2.88 in/sec PPV at 10 feet from a pavement breaker. Other typical construction activities and equipment, such as dozers, earthmovers, and trucks have not exceeded 0.10 in/sec PPV at 10 feet. Vibration sensitive instruments and operations may require special consideration during construction. Vibration criteria for sensitive equipment and operations are not defined and are often case specific. In general, the criteria must be determined based on manufacturer specifications and recommendations by the equipment user. As a guide, major construction activity within 200 feet and pile driving within 600 feet may be potentially disruptive to sensitive operations (Caltrans 2002). Construction of certain CIP projects may include blasting, which would have the potential to generate excessive groundborne vibration that may affect nearby vibration-sensitive uses, such as historic buildings. Historic buildings are located throughout the project area and the Rancho de los Quiotes (Kiotes)/Leo Carrillo Ranch is located in the immediate vicinity of two Sewer CIP projects. CIP projects located near existing commercial or industrial development that may be potentially disruptive to vibration-sensitive operations include the following:

- Sewer CIP Projects: SR-3, SR-14, SR-17, SR-24, C-2, C-3, C-4, and I-1
- Water CIP Projects: 49, 52, and 55

- Recycled Water CIP Projects: ES1, ES2, ES4B, ES4C, ES5, ES8, ES9, ES10, ES11, ES12, ES13, and ES18

As listed in Section 2.6.2 (Project Design Features), the City and CMWD have committed to providing advance notice of construction, between two and four weeks prior to construction, to residents or property owners within 300 feet of the alignment. For projects that would require pile driving or blasting, noticing will be provided to all residents or property owners within 600 feet of the alignment. The announcement will state specifically where and when construction will occur in the area. If construction delays of more than 7 days occur, an additional notice will be made, either in person or by mail.

Additionally, for any construction activities which include blasting, a qualified blasting consultant and geotechnical consultant will prepare all required blasting plans and monitor all blasting activities in conformance with the Standards of the State of California, Department of Mines. Therefore, vibration-sensitive land uses within the vibration screening distance for major construction activity would receive adequate notification to prepare for potential vibration. Although vibration may be an annoyance to residents, residential development does not include vibration sensitive equipment and is not considered a day-time vibration-sensitive land use. As discussed under Section 4.11.3.2 (Issue 2), construction activities would take place during the day in accordance with the affected cities' noise ordinances. Therefore, construction would not disturb sleep and would not result in a significant vibration impact to residential development.

Mitigation Measures

Impacts related to groundborne vibration would be less than significant. No mitigation is required.

Significance After Mitigation

Impacts related to groundborne vibration would be less than significant without mitigation.

4.11.3.4 Issue 4 – Aircraft Noise

Noise Issue 4 Summary

Would implementation of the Sewer, Water, and Recycled Water Master Plans expose people residing or working in the project area to excessive noise levels from aircraft noise?

Impact: Implementation of the Sewer, Water, and Recycled Water Master Plans would not exposure people to excessive aircraft noise.	**Mitigation:** No mitigation is required.
Significance Before Mitigation: Less than significant.	**Significance After Mitigation:** Impacts would be less than significant without mitigation.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the Master Plans would have a the potential to expose people to aircraft noise from if it would locate people within an airport land use plan or, where such a plan has not been adopted, within two miles of a public or private airport.

Impact Analysis

McClellan-Palomar Airport is located within Carlsbad. Several project components would be located within the McClellan-Palomar Airport Influence Area and Flight Activity Zone, including sewer and recycled water pipelines and improvements surrounding the airport (Sewer CIP Projects SR-3, SR-17, SR-24, and N-12, and Recycled Water CIP Project ES1). Oceanside Municipal Airport, a public airport, is located approximately 500 feet north of CIP Project 52 in Oceanside. The proposed CIP projects would construct sewer, water, and recycled water infrastructure and do not involve any construction or long-term operational features for human occupancy that would result in regular exposure to aircraft noise from McClellan-Palomar Airport or Oceanside Municipal Airport. Therefore, impacts would be less than significant.

Mitigation Measures

Impacts related to aircraft noise would be less than significant level. No mitigation is required.

Significance After Mitigation

Impacts related to aircraft noise would be less than significant level without mitigation.

4.11.4 Cumulative Impacts

Noise Cumulative Issue Summary

Would implementation of the Sewer, Water, and Recycled Water Master Plans have a cumulatively considerable contribution to a cumulative noise impact considering past, present, and probable future projects?

Cumulative Impact	Significant?	Project Contribution
Substantial Permanent Ambient Noise Increases	No	No cumulative impact.
Temporary Increases in Ambient Noise	No	No cumulative impact.
Generation of Groundborne Vibration	No	No cumulative impact.
Exposure to Aircraft Noise	No	No cumulative impact.

4.11.4.1 Substantial Permanent Ambient Noise Increases

Noise, by definition, is a localized phenomenon and is progressively reduced as the distance from the source increases; specifically, noise levels decrease by 6 dB for every doubling of distance. The area of cumulative impact that would be considered for the noise cumulative analysis would be only those projects within the immediate vicinity of the proposed CIP locations. Potential operational noise impacts from cumulative projects would be localized in nature, and all cumulative projects would be required to comply with the noise standards for the jurisdiction that they are located in. As discussed in Section 4.10.3.1 (Issue 1), maintenance for the proposed CIP projects may require occasional vehicle trips for maintenance. Due to the minimal number and the geographic distribution of vehicular trips associated with the maintenance of the CIP projects, transportation noise increases, in comparison to existing conditions, would not be perceptible. In addition, operational noise sources from CIP water storage projects and pipelines would be negligible once constructed since these are passive facilities. Implementation of enclosures or other measures to attenuate noise in compliance with the applicable noise ordinance would reduce potential operational noise impacts from new CIP pump and lift station projects and treatment facilities to a less than significant level. The Master Plans, in combination with other cumulative projects, would not result in a cumulatively significant increase in permanent ambient noise levels.

4.11.4.2 Temporary Increases in Ambient Noise

As noted earlier, noise impacts are highly localized due to the attenuating effect that distance has upon noise levels. Construction of cumulative development projects within the vicinity of the CIP project locations is not likely to result a substantial temporary increase in ambient noise levels due to the localized nature of noise impacts, and the likelihood that construction projects would not occur simultaneously or at the same location. In addition, construction noise for cumulative projects would be subject to the noise standards within the appropriate jurisdiction. As discussed in Section 4.10.3.2 (Issue 2) of this EIR, all CIP construction projects under the Master Plans would be required to comply with applicable local noise ordinances and regulations that limit construction hours, and construction of all CIP projects would implement best management practices to minimize construction noise. The Master Plans, in combination with cumulative projects, would not result in cumulatively significant increases in temporary noise levels.

4.11.4.3 Generation of Groundborne Vibration

Groundborne vibration is also a localized phenomenon that is progressively reduced as the distance from the source increases. The area of cumulative impact that would be considered for the vibration cumulative analysis would be only those projects within the immediate vicinity of the CIP locations. The primary source of groundborne vibration from cumulative projects would be construction equipment, such as pile drivers or blasting equipment. Construction of the cumulative projects within the vicinity of the proposed CIP locations is not likely to result in excessive groundborne vibration due to the localized nature of vibration impacts, and the likelihood that all construction would not occur at the same time or at the same location. As discussed in Section 4.10.3.3 (Issue 3) of this EIR, groundborne vibration due to CIP operations would not result in a significant impact with the implementation of the standard noticing included as part of the Project Design Features listed in Section 2.6.2 (Project Design Features). The Master Plans, in combination with cumulative projects, would not result in a cumulatively significant impact associated with excessive groundborne vibration.

4.11.4.4 Aircraft Noise

Exposure to aircraft noise is also a localized impact and the area of cumulative impact that would be considered for aircraft impacts would be only those projects located within two miles of McClellan-Palomar Airport or Oceanside Municipal Airport. The area surrounding within the noise contours for these airports is currently developed and would not be expected to experience substantial growth. Additionally, the proposed CIP projects would construct sewer, water, and recycled water infrastructure and do not involve any construction or long-term operational features for human occupancy that would result in regular exposure to aircraft noise. The Master Plans, in combination with cumulative projects, would not result in a cumulatively significant impact associated with aircraft noise.

4.11.5 References

City of Carlsbad. 1978. City of Carlsbad Municipal Code, Chapter 8.48, Noise.

City of Carlsbad. 1994. Carlsbad General Plan. Prepared 1994, Amended 2010.

City of San Marcos. 2004. City of San Marcos Municipal Code, Chapter 10.24, Noise. November 4.

City of Vista. 2000. City of Vista Municipal Code, Section 8.32, Noise Control. April.

County of San Diego (County). 2009. County of San Diego Municipal Code Title 3, Division 6, Chapter 4. Amended January 2009.

Federal Highway Administration (FHWA). 2006. Construction Noise Handbook. August.

Federal Transit Administration (FTA 2006), U.S. Department of Transportation. Transit Noise and Vibration Impact Assessment Manual. May 2006. Available at www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf